

# ***Interactive comment on “Cross-validation of bias-corrected climate simulations is misleading” by Douglas Maraun and Martin Widmann***

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We would like to thank Dr. Grillakis to direct us to his discussion paper. We will consider if and where to best refer to it in our manuscript. He raises an interesting point of biases in the representation of internal variability. We will consider whether this issue is relevant in the context of our paper.

Of course, he is right that even a model run with "perfect" boundaries will not be perfectly synchronised, but in many cases this effect should be minor on climatic time scales (e.g., Maraun & Widmann, HESS; 2015). Of course, this depends on the specific setup and on the correction method (e.g., a quantile mapping correction of extremes will need more data than a mean bias correction). But in RCMs where sea surface

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temperatures are taken from observations and spin-up effects mainly result from the soil moisture initialisation, the randomness should be negligible when averaging over a 30 year period.

We do not fully agree with the comment on using odd and even years in the cross validation. Here, of course, the effect of long-term modes of variability would cancel out, but randomness due to interannual variations might still be a dominating effect.

Finally, the issue of length of the calibration/validation period will be discussed. The issue of whether cross-validation is inadequate to reveal the weaknesses of the bias correction method to adjust multiyear modes' effect on precipitation is a subtle one which goes far beyond our manuscript: in Maraun et al., *Nat. Clim. Change* (2017) we argue that often the question is not so much about the bias correction method, but rather about the skill of the underlying climate model.

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